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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,789	11/26/2003	Charles Cameron Brackett	134689IT/YOD GEMS:0238	9064

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EXAMINER	
TUCKER, WESLEY J	

ART UNIT	PAPER NUMBER
2624	

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11/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,789	BRACKETT ET AL.	
	Examiner	Art Unit	
	Wes Tucker	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-39 and 41-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-39 and 41-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed August 17th 2007 has been entered and made of record.

2. Applicant has amended claims 1, 6, 12-16, 21-23, 26-27, 30, 32-33, 39, 41-42, 44-45, 48 and 50. New claims 51-56 have been added. Claims 7 and 40 have been cancelled.

3. Applicant's remarks have been fully considered. The newly presented amendments change the scope of the claimed invention and accordingly necessitate the new grounds of rejection presented herein. Because the amendments necessitate the new grounds of rejection the rejection is accordingly made FINAL.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 45-51 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Examiner appreciates the amendment to the previously rejected claims directed to computer programs. Applicant is encouraged to amend the claims to conform to the format of acceptable language as follows:

"A computer readable medium encoded with a computer program ..."

The reason for this requirement is as follows:

The acceptable language defines a "product" in the form of a computer readable medium, whereas the unacceptable language of claims 45-51 appears to define a "program". A program per se is non-statutory, as being an abstract idea. The element of "provided on a computer readable medium" may be where it is stored, but it is the program itself that is being claimed (and again, programs or software per se, are non-statutory).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 51 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 51 recites "wherein the feature of interest is substantially different in the first image as compared to the first image due to change of the feature of interest over time."

Obviously the first image cannot be substantially different from itself. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-56 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,909,792 to Carrott et al.

With regard to claim 1, Carrott discloses a method for aligning images, comprising:

Acquiring a first image and a second image (column 3, lines 11-20);

Identifying an anomaly in the first image (column 3, lines 22-43);

Identifying an anomaly in the second image (column 3, lines 44-50);

Registering the first image with the second image based on a property of the anomaly within the first image and on a corresponding property of the anomaly within the second image (column 3, lines 48-55 and column 4, lines 4-32); and

Storing the registration data corresponding to the registration (column 4, lines 34-53 and column 5, lines 9-27).

Carrott discloses a method for aligning images by identifying a region of interest or anomaly in a first image (column 3, lines 12-43), Identifying the same anomaly in the

second image taken sometime after the first (column 4, lines 3-21) and registering the two regions of interest or anomalies (column 4, lines 22-32). The tow images are then compared and the difference between the two calculated and displayed (column 4, lines 34-67). Carrott discloses the method to be operative in the same environment as intended in Applicant's specification, namely diagnosis and examination of anomaly tissue in mammograms.

With regard to claim 2, Carrott discloses the method of claim 1, further comprising displaying the registration data (column 4, lines 54-67).

With regard to claim 3, Carrott discloses the method of claim 2, wherein displaying the registration data comprises displaying a cine serial view of the first image and second image (column 5, lines 1-7).

With regard to claim 4, Carrott discloses the method of claim 2, wherein displaying the registration data comprises displaying an overlay image of the first image and the second image in stack mode (column 4, lines 54-67).

With regard to claim 5, Carrott discloses the method of claim 2, wherein displaying the registration data comprises displaying a composite image of the first and the second image (column 4, lines 54-67).

With regard to claim 6, Carrott discloses a method of registering images, comprising:

Segmenting a feature of interest in a first image (column 3, lines 12-40);

Segmenting a corresponding feature of interest in a second image, wherein the first image and second image are acquired in different temporal settings (column 3, lines 44-67);

Registering the first image with the second image by aligning the feature of interest with the corresponding feature of interest (column 4, lines 3-33); and

Storing image data corresponding to registration (column 4, lines 54-67).

With regard to claim 8, Carrott discloses the method of claim 6, wherein the first image and second image are acquired by the same modality (column 2, lines 60-67). Both images are acquired by ultra-sound.

With regard to claim 9, Carrot discloses the method of claim 6, wherein the first image and second image are acquired by different modalities (column 3 line 44 – column 4, line 32). Carrot discloses that the when the second image is first scanned it as at a coarse resolution for preliminary matching and then it is re-scanned at a fine resolution for more precise region of interest comparison

With regard to claim 10, Carrott discloses the method of claim 6, wherein the first image and second image are X-ray images (column 2, lines 60-67).

With regard to claim 11, the discussion of claim 2 applies.

With regard to claim 12, the discussion of claims 3, 4 and 5 applies.

With regard to claim 13, Carrott discloses a method for registering images, comprising:

Segmenting a feature of interest in a first image (column 3, lines 22-43);

Segmenting the feature of interest in a second image acquired subsequent to the first image (column 4, lines 3-20);

Determining s corresponding reference point of the feature of interest in the second image (column 4, lines 3-20);

Registering the first image with the second image by aligning the feature of interest with the corresponding feature of interest (column 4, lines 22-32); and

Storing image data corresponding to registration (column 4, lines 54-67).

With regard to claim 14, the discussions of claims 3, 4 and 5 apply.

With regard to claim 15, the discussion of claim 1 applies.

With regard to claim 16, Carrot discloses the method of claim 13, wherein the reference point is in the middle of the feature of interest in the first image; and the

corresponding reference point is in the middle of the feature of interest in the second image (Figs. 6a-6b).

With regard to claim 17, Carrott discloses the method of claim 13, wherein the first image and the second image are acquired in different temporal settings (column 3, lines 12-20).

With regard to claim 18, Carrott discloses the method of claim 13, wherein the segmenting is automated (column 3, lines 30-42).

With regard to claim 19, Carrott discloses the method of claim 13, wherein registering is automated (column 4, lines 3-32).

With regard to claim 20, Carrott discloses the method of claim 13, further comprising determining additional reference points and registering the first image with the second image based on the additional reference points (column 3, lines 44-67). Carrott teaches that other features such as the outline of the object are also used for alignment.

With regard to claim 21, Carrot discloses a method for anchoring images, comprising:

Identifying and sizing an anomaly in a first image of a subject (column 3, lines 22-44);

Identifying and sizing a corresponding anomaly in a second image of the subject (column 4, lines 4-32);

Locating a first reference point on the anomaly (column 8, lines 41-67)

Locating a second reference point on the corresponding anomaly (column 8, lines 41-67).

Registering the first image with the second image based on anchoring the first reference point with the second reference point (column 8, lines 41-67 and column 9, lines 60-64); and

Storing registration data corresponding to registration (column4, lines 54-67).

Carrott discloses registering first and second images of a 3D object taken at different times. The two images are first coarsely registered and then registered at a finer resolution that is focused on a region of interest or anomaly. The regions of interest or anomalies are then aligned more precisely and compared. Points, which are defined for the images in Carrott as pixels or voxels, are considered located and matched up on the fine resolution matching of the regions of interest. These points are used to align the images, which are then displayed together along with the difference between the two images such as growth of a lesion. The alignment is performed using coordinate points in order to align the two images as seen in Figs. 6a-6c.

With regard to claim 22, Carrott discloses the method of claim 21, wherein one or more computer aided techniques are used to identify and size the anomaly and the corresponding anomaly (column 3, lines 22-44 and column 4, lines 3-32).

With regard to claim 23, Carrott discloses the method of claim 21, wherein the anomaly and the corresponding anomaly are manually identified (column 3, lines 28-31).

With regard to claim 24, Carrott discloses the method of claim 21, wherein the first reference point and the second reference point are location markers fro the registration (column 8, lines 41-67 and column 9, lines 60-64 and figs. 6a-6c).

With regard to claim 25, Carrott discloses the method of claim 24, wherein registration comprises rigid body registration transformation (column 8, lines 41-67 and column 9, lines 60-64 and Figs. 6a-6c).

With regard to claim 26, Carrott discloses the method of claim 25, wherein the rigid body registration transformation comprises at least one of a translation, a rotation, and magnification (column 5, lines 37-42 and column 7, lines 39-41).

With regard to claim 27, Carrott discloses the method of claim 21, wherein registration comprises warped registration and elastic transformation (column 7, lines

39-60). Carrott teaches the need for warped registration and elastic transformation because when a breast as imaged is compressed differently from one image to the next a scaling or de-warping will be necessary to improve registration between the two images.

With regard to claim 28, Carrott discloses the method of claim 21, wherein the registration comprises a combination of a rigid body registration and a warped registration (column 7, lines 39-60, column 8, lines 41-67 and column 9, lines 60-64 and Figs. 6a-6c).

With regard to claim 29, Carrott discloses the method of claim 21, further comprising accessing the registration data to compare the first image with the second image (column 4, lines 34-67).

With regard to claim 30, Carrott discloses the method of claim 21, further comprising accessing registration data to compare the anomaly with the corresponding anomaly (column 4, lines 34-67).

With regard to claim 31, Carrott discloses the method of claim 30, further comprising displaying the registration data in at least one of a cine display, an overlay display ins tack mode or a composite image (column 4, lines 54-67).

With regard to claim 32, Carrott discloses a system fro registering images comprising:

One or more imaging systems from acquiring and storing images (column 3, lines 12-20 and fig. 1, elements 40 and 20);

A first interface for accessing reviewing, processing, and registering the images (Fig. 1, elements 32 and 34);

A storage for storing image registration data (column 4, lines 54-67 and Fig. 1, element 38); and

A processor configured to register the images based on alignment of corresponding features of interest in the images (Fig. 1, elements 24 and 30, and column 4, lines 22-67).

With regard to claim 33, Carrott discloses the system of claim 32, further comprising a second interface or monitor for displaying the registration data in at least one of a cine, a stack, an overlay or a composite (Fig. element 34 and column 4, lines 34-67).

With regard to claim 34, Carrot discloses the system of claim 33, wherein the first interface and the second interface are the same interface and are a PACS workstation (Fig. 1).

With regard to claim 35, Carrott discloses the system of claim 32, further comprising a scanner for converting analog film images to digital images (Fig. 1, element 40).

With regard to claim 36, Carrott discloses the system of claim 32, wherein the images are digitized images and digitally acquired images (Fig. 1, elements 40 and 20).

With regard to claim 37, Carrott discloses the system of claim 32, wherein the images are digital images and scanned images (Fig. 1, elements 40 and 20).

With regard to claim 38, Carrott discloses the system of claim 32, wherein one or more imaging systems comprise a conventional x-ray imaging system, a digital X-ray system, a CT imaging system, a MR imaging system, or any combination thereof (column 1, lines 25-29).

With regard to claim 39 Carrott discloses a system from comparing images, comprising:

Means for identifying and locating an anomaly in a first image (column 3, lines 22-43 and Fig. 1, elements 30 and 24);

Means for identifying and locating the anomaly in a second image (column 3, lines 44-50 and Fig. 1, elements 30 and 24);

Means for registering the first image with the second image based on a location of the anomaly in the first image and on a corresponding location of the anomaly in a second image (column 3, lines 48-55 and column 4, lines 4-32 and Fig. 1, elements 30 and 24);

Means for storing registration data corresponding to registration (column 4, lines 34-53 and column 5, lines 9-27 and Fig. 1, element 38); and

Means for displaying the registration data (Fig. 1, element 34).

With regard to claim 41, the discussions of claims 3, 4 and 5 apply.

With regard to claim 42, the discussions of claims 6 and 39 apply. See claim 6 for the steps and claim 39 for the means.

With regard to claim 43, Carrott discloses a display (Fig. 1, element 34).

With regard to claim 44, the discussions of claim 21 and 39 apply. See claim 21 for the steps and see claim 39 and generally Fig. 1 for the means.

With regard to claim 45, the discussion of claim 1 applies. Carrott discloses a computer program product and automated routines for performing the steps of the methods already discussed (Fig. 1).

With regard to claim 46, the discussion of claim 2 applies.

With regard to claim 47, the discussion of claim 3, 4 and 5 apply.

With regard to claim 48, the discussion of claims 6 and 45 apply.

With regard to claim 49, the discussion of claim 2 applies.

With regard to claim 50, the discussions of claims 13 and 45 apply.

New Claims

7. With regard to claim 51, Carrot discloses the method of claim 50, wherein the first image and second image are acquired in different temporal settings, and wherein the feature of interest is substantially different in the first image as compared to the first image [second image] due to change of the feature of interest over time (column 4, lines 54-67).

With regard to claim 52, the location of the anomaly is used to align the images (column 4, lines 3-32).

With regard to claim 53, the images are considered to be acquired by the same imaging system (column 3, lines 12-21).

With regard to claim 54, the images are taken at different times and compared (column 4, lines 34-53).

With regard to claim 55, the images can be compared if taken one after another the same as they are compared taken over longer periods of time (column 4, lines 54-67).

With regard to claim 56, Carrot accounts for change in the feature of interest over time and seeks to highlight that change (column 4, lines 34-67).

FINAL REJECTION

8. Applicant's amendment necessitated the new grounds of rejction presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wes Tucker

11-6-07

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